PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Knowledge, attitudes, perceptions and habits towards antibiotics dispensed without medical prescription: a qualitative study of Spanish pharmacists.
AUTHORS	Vazquez-Lago, Juan; Gonzalez-Gonzalez, Cristian; Zapata-Cachafeiro, Maruxa; Lopez-Vazquez, Paula; Taracido, Margarita; Lopez, Ana; Figueiras, Adolfo

VERSION 1 - REVIEW

REVIEWER	Carolina Rodríguez Gay Ministry of Health, Social Services and Equality os Spain
REVIEW RETURNED	06-Feb-2017

GENERAL COMMENTS	Interested subject due to the important antibiotic resistance problems we are dealing to. Also related to the European and Spanish strategy to prevent antibiotic resistances. Really good initiative. Check paragraph 264-268 for English translation.

REVIEWER	Fátima Roque Unit for Inland Development, Guarda Polytechnic (UDI/IPG), Guarda, Portugal
REVIEW RETURNED	15-Feb-2017

GENERAL COMMENTS	Self-medication and antibiotic dispensed by pharmacists without a medical prescription is an important problem that has been studied by some authors. However the reasons underlying this is not yet well studied in all the countries where dispense without prescription occurres. In that way this is an interesting study that explores attitudes related to antibiotic dispensing without medical prescription. I have some comments. How where pharmacists recruited to participated in the focus group sessions? And how was the invitation prformed? This should be explained in the methods section. The authors refer that they sought to ensure a high degree of heterogeneity in the composition of the groups. Are them so heterogeneity? Did the authors really ensured it? How many pharmacists were excluded to ensure heterogeneity? In page 5, line 133 - authors identified “lack of continuing education”, but after this yhey use onother terminology “lack of knowledge upgrade” , The same term shoul be used along the manuscript. Table 2 – How was calculated percentage of non-prescription antibiotics? It was mentioned by pharmacists? And all pharmacists

	in the same FG mentioned the same percentage? Or it was calculated from information given by pharmacists? These should be clarified. Page 10, line 319-320 – Analysis of lack of continuing education showed a difference between professional of different age". Did the authors quantified it? Was it statistical different? If yes, these results should be shown in the manuscript. Please check each reference number with references list.

REVIEWER	Tahir Khan Monash University
REVIEW RETURNED	17-Feb-2017

GENERAL COMMENTS	Authors have selected a good topic. Its really important to explore the factors motivating the pharmacist to dispense antibiotics without prescription. However, in this study authors conducted 5 focus groups (N=30) of whom only 6--7 respondents shared their experience about dispensing without prescription. Moreover, the results reported are very superficial. there is a need to further explore the motivators and facilitators of dispensing without prescription in detail.

REVIEWER	Anwen Cope Honorary Lecturer, Cardiff University, UK
REVIEW RETURNED	27-Mar-2017

GENERAL COMMENTS	Thank you for the opportunity to review this manuscript which describes a qualitative study which sought to explore the attitudes of community pharmacists in Galicia, Spain regarding the practice of dispensing antibiotics in the absence of a prescription. The rationale for this study is clearly outlined, the sale of antibiotics without a prescription accounts for approximately a third of outpatient antibiotic consumption in Spain, and there is concern this could contribute to the emergence of antimicrobial resistance. Furthermore, the reasons for using qualitative methods, in this case focus groups, were well described. However, whilst this is an interesting study, I have a number of concerns about its reporting and the conclusions reached by authors. Abstract The abstract should state the analytical approach employed. 'Results could also be compromised by due to the intrinsic characteristics of the pharmaceutical system in Spain' – could authors clarify what they mean here for readers who may not be familiar with the Spanish healthcare system. Methods Reporting of the study could be improved if a checklist for reporting qualitative research (e.g. COREQ) had been followed. Authors refer to a systematic literature review that informed the focus group agenda. Has this been published?

	There is repetition of information from the Introduction in the section entitled 'Study population and setting'. I would suggest this information fits better into Methods and therefore should be removed from earlier sections. I am concerned about authors' frequent use of concepts such as 'external validity' and 'bias' throughout the manuscript. Whilst qualitative methods can seek to obtain a range of views, generalisability of findings is not usually an expected attribute of this type of research. Similarly, the nature of qualitative data is that it is jointly constructed by the researcher and participants and cannot be viewed as objective accounts. Therefore rather than seeking to introduce 'independent researchers' into the analysis with the aim of decreasing 'researcher bias', I would have preferred the individual who conducted the focus groups to be more involved in their analysis and to see a reflexive account from that researcher in which they explore how their characteristics, assumptions and interests in the research area could have shaped what was said in the focus groups and the meaning subsequently derived from these. The last sentence of 'Analysis' is difficult to follow and authors may wish to revise this. Results Instead of percentages of male and female pharmacists it would be more acceptable to include a table outlining the composition of the focus groups group in terms of participant's age group, sex, their status as practice owner/employee (as authors identify that that may influence attitudes towards prescription), and which focus group they participated in. It was not always clear which results were specifically related to dispensing of antibiotics without a prescription and which were more general points about antibiotic prescribing. I would suggest authors may wish to clarify this further to avoid confusion. In my opinion, several of the quotations presented in the sub-sections entitled 'Lack of continuing education' and 'Indifference' do not illustrate the points being made by authors. Under the sub-heading, 'Indifference' authors discuss 'businessman status' and delayed prescribing. However neither comfortably fits under the definition of 'indifference' stated by authors (Table 1). Table 2 does not really add anything to the interpretation of findings. Discussion In the second paragraph authors mention that the study was underpinned by grounded theory. This is the first reference to this in the paper and therefore if the study was indeed undertaken according to the principals of grounded theory I would expect this to be mentioned during previous sections, and reference made to theoretical sampling, saturation etc. In their analysis of 'lack of continuing education' authors describe differences between pharmacists of different ages. This they state may be due to 'the fear factor', however since authors themselves acknowledge there is no evidence from the focus groups to support this, caution should be exercised in going beyond what the data

	shows.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Carolina Rodríguez Gay
Institution and Country: Ministry of Health, Social Services and Equality of Spain Please state any competing interests or state 'None declared': None declared
Please leave your comments for the authors below
Interested subject due to the important antibiotic resistance problems we are dealing to. Also related to the European and Spanish strategy to prevent antibiotic resistances. Really good initiative.
Thank you so much. We really appreciate your commentary.

Check paragraph 264-268 for English translation.
Thank you for the advice. The paragraph was revised and corrected, as follows: "ok, I see, but this is about that it is difficult for them (people) to understand, I mean, surely if you talk to somebody about resistance it will sound familiar to him, but trying to explain him how resistances are generated..., you know what I mean, an effective way to make them understand that if they take that, or those, antibiotic without needing it, it's not going to take effect later on"
We have added it to the text, in page 10, lines 300-304.

Reviewer: 2
Reviewer Name: Fátima Roque
Institution and Country: Unit for Inland Development, Guarda Polytechnic (UDI/IPG), Guarda, Portugal
Please state any competing interests or state 'None declared': None Declared

Please leave your comments for the authors below
Self-medication and antibiotic dispensed by pharmacists without a medical prescription is an important problem that has been studied by some authors. However the reasons underlying this is not yet well studied in all the countries where dispense without prescription occurs. In that way this is an interesting study that explores attitudes related to antibiotic dispensing without medical prescription.
Thank you so much. We really appreciate your commentary.

I have some comments.
How where pharmacists recruited to participated in the focus group sessions? And how was the invitation performed? This should be explained in the methods section.
The recruitment of the participants was made by the "snowball method". This means that we have informed some "key" individuals in order to inform and encourage the participation in the project. These subjects (key informants) in our study were those responsible of the Official Colleges of Pharmacy in Galicia. In Spain, it is necessary to belong to an Official College in order to work in a community pharmacy.
Key informants distributed information about this research project among collegiate pharmacists through the usual methods in their organization. This information included a contact mail to express their interest in participating.
From the pharmacists who contacted the research group expressing their interest, the focus groups were configured.
We have added this information in the methods section. Page 6, lines 155-160.

The authors refer that they sought to ensure a high degree of heterogeneity in the composition of the groups. Are them so heterogeneity? Did the authors really ensured it? How many pharmacists were excluded to ensure heterogeneity?
In qualitative methodology is important to involve the largest number of people with different

professional and socio-demographic profiles. The authors made sure to perform groups of people with different ages, sex, rural or urban areas and different responsibilities in their work in the pharmacy office. This allows us to perform heterogeneous groups where participants can express different attitudes and behaviours, as well as to explore the cause of these behaviours through the confrontation of ideas and the consensus. [1,2,3] We have not excluded any participants among those who accepted to participate, as already explained above, and an important point in focus groups is to obtain a wide variety of ideas, behaviour, speeches... Finally, 30 pharmacists accepted to participate and all those who accepted were included in groups. The specific number of pharmacists who were informed but refused to participate is not known by the authors of this manuscript. The Galician Official Colleges of Pharmacists did not provide us with this information

1. Krueger RA, Casey MA. Focus Groups. A Practical Guide for Applied Research. 2000. Thousand Oaks CA Sage Publications
2. Morgan, DL. Qualitative Research Methods: Focus groups as qualitative research: SAGE Publications Ltd. 1997.doi: 10.4135/9781412984287
3. Giacomini MK, Cook DJ. Users' guides to the medical literature XXIII. Qualitative research in health care. A. Are the results of the study valid?. JAMA. 2000; 284: 357-62.

In page 5, line 133 - authors identified “lack of continuing education”, but after this they use another terminology “lack of knowledge upgrade”, The same term should be used along the manuscript.
Thank you for the advice. We have corrected it, now it`s mentioned as “lack of continuing education” in both sections. Moreover, we have changed it in table 1.

Table 2 – How was calculated percentage of non-prescription antibiotics? It was mentioned by pharmacists? And all pharmacists in the same FG mentioned the same percentage? Or it was calculated from information given by pharmacists? These should be clarified.
It was mentioned by the pharmacists. It was not calculated. This percentage was reached in each focus group by the consensus of the participants. We asked the participants what is the percentage of non-prescription antibiotics they considered to exist, then it was agreed between the participants in each focus group.
Old Table 2 is deleted for the final version of the manuscript based on the reviewer’s recommendation. And based on the recommendations of another reviewer, a new table 2 is generated, which can be seen in the new version of the manuscript, as well as in the response document to the reviewers.

Page 10, line 319-320 – Analysis of lack of continuing education showed a difference between professional of different age”. Did the authors quantified it? Was it statistical different? If yes, these results should be shown in the manuscript.

Lack of continuing education was not quantified. It was not considered as an objective for the present study. We think that in qualitative methodology to quantify a phenomenon is not so important as to verify that the phenomenon exists and it can be identified by the group. This allows us to identify an attitude or a behavior, trying to explain it from a logical point of view, and to be able to be contrasted later by quantitative methodology. This aspect pointing the reviewer is very interesting to be analyzed in future research.

Please check each reference number with references list.
Thank you for the advice. Bibliographic references have been checked and now, we think that the reference list is correct.

Reviewer: 3

Reviewer Name: Tahir Khan
Institution and Country: Monash University. Please state any competing interests or state ‘None declared’: None

Please leave your comments for the authors below
Authors have selected a good topic. It’s really important to explore the factors motivating the pharmacist to dispense antibiotics without prescription.
Thank you so much. We really appreciate your commentary.

However, in this study authors conducted 5 focus groups (N=30) of whom only 6--7 respondents shared their experience about dispensing without prescription. Moreover, the results reported are very superficial. There is a need to further explore the motivators and facilitators of dispensing without prescription in detail.

It is very interesting what you propose, and we hope that our response is to your liking.
Qualitative methods, in our case the focus group method, can seek to obtain a range of views about different problems identified. The nature of qualitative data is that it is jointly constructed by the researcher and participants and cannot be viewed as objective accounts. We have used this methodology to see a reflexive account from that researcher in which they explore how their characteristics are, assumptions and interests in the research area could have shaped, what was said in the focus groups and the meaning subsequently derived from these. So, in this design we wanted to identify those attitudes/behaviors/knowledge that would allow us to generate hypotheses about the dispensation of antibiotics without medical prescription, to later be able to expose those hypotheses through more powerful designs.
The motivators and facilitators of dispensing without prescription are not explored in detail in this paper because we have already done it in another study with a quantitative design, and that is referenced in the current manuscript at page 17, reference 22.
22. Zapata-Cachafeiro M, González-González C, Vázquez-Lago JM, López-Vázquez P, López-Durán A, Smyth E, Figueiras A. Determinants of antibiotic dispensing without a medical prescription: a cross-sectional study in the north of Spain. J Antimicrob Chemother. 2014; 69: 3156-60.

Reviewer: 4
Reviewer Name: Anwen Cope
Institution and Country: Honorary Lecturer, Cardiff University, UK Please state any competing interests or state ‘None declared’: None declared

Please leave your comments for the authors below
Thank you for the opportunity to review this manuscript which describes a qualitative study which sought to explore the attitudes of community pharmacists in Galicia, Spain regarding the practice of dispensing antibiotics in the absence of a prescription. The rationale for this study is clearly outlined, the sale of antibiotics without a prescription accounts for approximately a third of outpatient antibiotic consumption in Spain, and there is concern this could contribute to the emergence of antimicrobial resistance. Furthermore, the reasons for using qualitative methods, in this case focus groups, were well described. However, whilst this is an interesting study, I have a number of concerns about its reporting and the conclusions reached by authors.
Thank you so much. We really appreciate your commentary.

Abstract
The abstract should state the analytical approach employed.
We have used the Grounded Theory Approach. The Grounded Theory Approach involves constant comparative analysis or what has come to be called the Constant Comparative Method. This involves the researcher moving in and out of the data collection and analysis process. This back and forth

movement between data collection and analysis is sometimes called an 'iteration.' Grounded theory research involves multiple iterations. The process begins with the researcher asking a question or a series of questions designed to lead to the development or generation of a theory regarding some aspect of social life (e.g. how do community pharmacists dispensing antibiotics without medical prescription). This generative question, leads to the first iteration of theoretical sampling. Identifying an initial sample of people to observe or talk to.[4]
We have included it in the abstract, and we have also included it in section of “Analysis” in page 7 line 189-201.

4. Corbin, J. & Strauss, A. Grounded theory method: Procedures, canons, and evaluative criteria. Qualitative Sociology. 1990. 13:3-21.

‘Results could also be compromised by due to the intrinsic characteristics of the pharmaceutical system in Spain’ – could authors clarify what they mean here for readers who may not be familiar with the Spanish healthcare system.
There is an error in this sentence. The authors want to refer to the generalization of results, so it was necessary to start the sentence as “The generalization of the results could...”. The generalization of the results of our study can be affected by the characteristics of the system of community pharmacies in Spain, regulated by legislation that may differ in many respects from the legislation of other countries or territories. E.g. In the system of pharmaceutical provision in Spain, antibiotics necessarily require a prior prescription by the physician, all drugs must always be dispensed in pharmacies, and cannot be purchased in other types of establishments. Community pharmacies in Spain are acquired through a public tender, then become the property of the pharmacist who has won the public tender. Once it is acquired, it is managed in the way that the owner considers, except for drugs that require prescription ... among other characteristics.
An example so that readers can understand the main difference between the Spanish system and other systems in terms antibiotic is added to this section of the article.
We have included it in “Strengths and limitations” section, page 3 line77-81: 1.- The generalization of the results could also be compromised due to the intrinsic characteristics of the pharmaceutical system in Spain. E.g. In the system of pharmaceutical provision in Spain, antibiotics necessarily require a prior prescription by the physician, all drugs must always be dispensed in pharmacies, and cannot be purchased in other types of establishments.

Methods
Reporting of the study could be improved if a checklist for reporting qualitative research (e.g. COREQ) had been followed.
We really appreciate the comment. We have downloaded the COREQ checklist, and this is attached as a document. We have made some changes on the manuscript based on the items of the COREQ checklist. This has improved the methodology and the discussion of our results.

Authors refer to a systematic literature review that informed the focus group agenda. Has this been published?
Yes, it was published. In the previous version it was reference number 30. As we have corrected the reference list, now it is reference number 13.
13. Lopez-Vazquez P, Vazquez-Lago JM, Figueiras A. Misprescription of antibiotics in primary care: a critical systematic review of its determinants. J Eval Clin Pract. 2012; 18: 473-84.

There is repetition of information from the Introduction in the section entitled ‘Study population and setting’. I would suggest this information fits better into Methods and therefore should be removed from earlier sections.
We thank the proposal of the reviewer. We have removed the information from the introduction section and it is maintained in methods “Study population and setting” page 5 line 141. So, the final

version of the manuscript would be as follows:
Population density in Galicia is 92.6 inhab/km², similar to the European average. Population density decreases as one moves inland from Atlantic fringe. Consequently, distances to a given population's designated health centre tend to increase. In this way, Due to population density characteristics at our territory, community pharmacists are the first point of contact for patients as part of the health care team. Therefore so, up to one third of all outpatient antibiotics dispensed are not prescribed by physicians.

I am concerned about authors' frequent use of concepts such as 'external validity' and 'bias' throughout the manuscript. Whilst qualitative methods can seek to obtain a range of views, generalisability of findings is not usually an expected attribute of this type of research. Similarly, the nature of qualitative data is that it is jointly constructed by the researcher and participants and cannot be viewed as objective accounts. Therefore rather than seeking to introduce 'independent researchers' into the analysis with the aim of decreasing 'researcher bias', I would have preferred the individual who conducted the focus groups to be more involved in their analysis and to see a reflexive account from that researcher in which they explore how their characteristics, assumptions and interests in the research area could have shaped what was said in the focus groups and the meaning subsequently derived from these.
Focus groups were conducted and moderated by principal research (JVL). This new information was added to the section "Holding of focal group sessions", page 6 line 175. The principal researcher has participated in the transcription and analysis of the groups, as the reviewer suggests. This can be read in section "Analysis", page 7 lines 190-191: "Analysis of the transcripts was an iterative process undertaken by two independent researchers (CGG and JVL)". We mention the data validity and the decrease of the researcher's bias to ensure the interpretation of the transcripts.

The last sentence of 'Analysis' is difficult to follow and authors may wish to revise this.
The previous sentence "A computerised format was not necessary used to process the results because was not involved a large number of interviews." was not clear enough so we have decided to remove it. We have added this new sentence "Not was used an informatics software during analysis process because a large number of focus groups were not performed."

Results
Instead of percentages of male and female pharmacists it would be more acceptable to include a table outlining the composition of the focus groups group in terms of participant's age group, sex, their status as practice owner/employee (as authors identify that that may influence attitudes towards prescription), and which focus group they participated in.
Thank you so much for the idea. We have included a new table 2 (page 7 line 209)with the characteristics of the focus groups, as the reviewer suggests, in the "Results" section, page 7 line 206-207: "Other characteristics of the FG can be seen in Table 2"
Old Table 2 is deleted for the final version of the manuscript based on your recommendation (see below) and in another reviewer's recommendation.

Table 2. Characteristics of focus group composition.

It was not always clear which results were specifically related to dispensing of antibiotics without a prescription and which were more general points about antibiotic prescribing. I would suggest authors may wish to clarify this further to avoid confusion.
We agree with the reviewer's opinion, sometimes it was not clear enough. A new table (table 3) was added to the manuscript where we consider that is clarify the results were specifically related to dispensing of antibiotics without a prescription. Table 3 is in page 8 line 224.

Table 3. Factors that influence antibiotic dispensing.
Indifference due lack of communication with patient's physicians
due to lack of patient follow-up
due it is prioritized to sell the antibiotic

External responsibility
of patient (inappropriate use)
of physicians (prescriptions without indication)
of health care system (private insurances)
of other professionals (mainly dentists)

Complacency pressure exerted by customers to have the symptoms speedily resolved
to prevent regular customers consulting another pharmacy

Lack of continuing education dispensing habit

In my opinion, several of the quotations presented in the sub-sections entitled 'Lack of continuing education' and 'Indifference' do not illustrate the points being made by authors.
We thank the proposal of the reviewer. We consider it very timely what the reviewer says. We accept it and correct it. We modify the text of the article where reference is made to these subsections in the hope that this will illustrate the points being made by authors. The new text is included at page 9 lines 252-267 and page 9-10 lines 282-315. It is as follows:

Lack of continuing education (page 9 lines 252-267)
Lack of continuing education was considered a relevant factor by 80% of the FGs (4/5) in any case where a pharmacist dispensed antibiotics without a prescription. As shown above, lack of continuing education can be viewed from different standpoints, e.g., "In specific diseases, there is a range of antibiotics and you start with the oldest." (FG3; W3). In this case, it shows the lack of knowledge about what to start with the first-line antibiotic, that is not always the oldest.
Age is also referred to as a key variable to explain the existence of lack of continuing education, being older pharmacists which exhibit this deficit. "Older pharmacists give out antibiotics much more readily."(FG2, M1), and, "Young people give out fewer antibiotics." (FG3; W3).
Another aspect mentioned and related to lack of continuing education is the consideration of the problem of resistance as a recent phenomenon. "I think that issue of resistance has recently begun, not so long ago…" (FG1, W2).

Indifference (page 9-10 lines 282-315)
Participants indicate the existence of indifference and mutual consent between community pharmacists and other health-care professionals, chiefly physicians, along with inappropriate attitudes to prescribing and dispensing antibiotics; Noting the lack of communication as indirectly associated with indifference, i.e., "I give you amoxicillin-clavulanate… but you go to your doctor and bring me the

prescription. That way I feel I'm blameless." (FG5; W2).
In a third FG, the following statements were made: "The two professions are hardly involved with each other, there are no close ties, so that we criticise our mistakes but don't value our successes"; and, "Sometimes I dispense an inappropriate antibiotic because I don't have the time to contact the patient's physician." (FG2; W1) (Table 1). In this case they identify communication difficulties as the cause of inadequate dispensation but show indifference when solving the problem.
We also appreciate the existence of Indifference when they must transmit adequate information about the problems of resistances to customers who go to the pharmacy to buy antibiotics, well, Indifference is other possible way to contribute to develop microbial resistances. “Ok, I see, but this is about that it is difficult for them (people) to understand, I mean, surely if you talk to somebody about resistance it will sound familiar to him, but trying to explain him how resistances are generated..., you know what I mean, an effective way to make them understand that if they take that, or those, antibiotic without needing it, it's not going to take effect later on” (FG1, W2).
Finally, another aspect that is framed within the Indifference is the fact that in Spain the pharmacist is also a businessman. "In addition to being health-care professionals, we are also businessmen." (FG2; M2), so it is concerned, in addition to the health of the individual, by the profitability of the business. This statement reflects it: "Take it home. If you get better, don't take it, just bring it back to me! …and most people bring it back." (FG2; W1). This sentence also refers to what we call "delayed dispensing" which is related to the delayed prescriptions. Delayed prescriptions are those that are written but are only used if the symptoms do not improve.[5] Delayed dispensing of antibiotics can thus be defined as the dispensing of antibiotics for a patient, on the condition that they are not to be used immediately but only in the event that the symptoms fail to improve.

5.- Arroll B, Kenealy T, Goodyear-Smith F, Kerse N. Delayed prescriptions. BMJ. 2003; 327: 1361-2.

Under the sub-heading, ‘Indifference’ authors discuss ‘businessman status’ and delayed prescribing. However neither comfortably fits under the definition of ‘indifference’ stated by authors (Table 1).
The definition of the attitudes studied was made a priori based on a previous studies carried out on primary care physicians in our research group (references 13 and 14 in the paper) and modified for the expected characteristics of community pharmacists. This is explained in the section "Study design" (page 5 line 124-125 and 129-132). The behaviours related to businessman status and delayed prescribing emerged during the realization of the focus groups. They were included in the discussion sections because we considered that it identified, reinforced and showed a component factor that we did not expect a priori.
13. Lopez-Vazquez P, Vazquez-Lago JM, Figueiras A. Misprescription of antibiotics in primary care: a critical systematic review of its determinants. J Eval Clin Pract. 2012; 18: 473-84.
14. Vazquez-Lago JM, Lopez-Vazquez P, López-Durán A, Taracido-Trunk M, Figueiras A. Attitudes of primary care physicians to the prescribing of antibiotics and antimicrobial resistance: a qualitative study from Spain. Fam Pract. 2012; 29: 352-60.

Table 2 does not really add anything to the interpretation of findings.
We agree with the reviewer’s opinion. This information was already shown in the results section. The previous table 2 is deleted. Now, we have added a new table 2 with the characteristics of the focus groups, as we have explained in a previous point.

Discussion
In the second paragraph authors mention that the study was underpinned by grounded theory. This is the first reference to this in the paper and therefore if the study was indeed undertaken according to the principals of grounded theory I would expect this to be mentioned during previous sections, and reference made to theoretical sampling, saturation etc.
We accept the proposal. We have corrected it, and as we have said in previous sections, a reference to the grounded theory is included in the Abstract and in the Methods section.

In their analysis of ‘lack of continuing education’ authors describe differences between pharmacists of different ages. This they state may be due to ‘the fear factor’, however since authors themselves acknowledge there is no evidence from the focus groups to support this, caution should be exercised in going beyond what the data shows.
The reviewer is right. We focus on fear factor because this factor was found in a previous study, with similar objectives, carried out in primary care physicians. Because of this, a parallelism was established between those health professionals and these. The reference to the fear factor is maintained during the manuscript; however the writing is more cautious to make the reader understand that this must be interpreted with careful. We have added new text in page 12, line 363-366. “This factor are possibly linked to the major fear felt by young pharmacists on dispensing antibiotics, just as it was found in a study about physicians performed in our environment [6]. Even though none of the FGs mentioned this variable, so it is necessary to interpret this very cautiously.”

6. Vazquez-Lago JM, Lopez-Vazquez P, López-Durán A, Taracido-Trunk M, Figueiras A. Attitudes of primary care physicians to the prescribing of antibiotics and antimicrobial resistance: a qualitative study from Spain. Fam Pract. 2012; 29: 352-60.

VERSION 2 – REVIEW

REVIEWER	Fátima Roque Polytechnic Institute of Guarda, Portugal
REVIEW RETURNED	18-May-2017

GENERAL COMMENTS	As mentioned before, this si an interesting and well written article. The changes made by the authors during the review process have improved the manuscript.

REVIEWER	Anwen Cope Cardiff and Vale University Health Board/Cardiff University, UK
REVIEW RETURNED	16-May-2017

GENERAL COMMENTS	Thank you for the opportunity to re-review this paper. In its current format, the manuscript represents an improvement on what was initially reviewed; the authors have sought to clarify some of the points raised and have revised a substantial portion of the Results section. I still have some concerns about the reporting of this study, particularly the depth of analysis, which still feels relatively superficial. I also believe that the quality of English in some of the newly added sections would benefit from review. Title "a qualitive study of Spanish pharmacists" may be more appropriate than a study "on" them. Methods Page 5, line 130, I am unfamiliar with the term 'a dash of a FG [focus group]' - do the authors mean 'script' or 'topic guide'? Page 7, 196, can the authors clarify whether the analysis "two independent researchers" or "two researchers working independently", as their explanation seems to suggest the latter? Table 1 'Bad' is insufficently descriptive to describe continuing education. Do

	authors intend to imply that the amount of continuing education is insufficient or that the quality was poor or both? COREQ checklist I can not find evidence in the manuscript of reflexivity on the part of the researcher. Review English: page 2, line 47; page 3, 81; page 6, line 161; page 7, line 206; page 10, 302; page 15, line 474 Check references: page 13, page 402; page 13, line 408

VERSION 2 – AUTHOR RESPONSE

Reviewer: 4
Reviewer Name: Anwen Cope
Institution and Country: Cardiff and Vale University Health Board/Cardiff University, UK Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below.
Thank you for the opportunity to re-review this paper. In its current format, the manuscript represents an improvement on what was initially reviewed; the authors have sought to clarify some of the points raised and have revised a substantial portion of the Results section.
Thank you so much. We really appreciate your commentary.

I still have some concerns about the reporting of this study, particularly the depth of analysis, which still feels relatively superficial.
We appreciate reviewer's suggestion regarding depth of analysis. Changes have been made in the manuscript with the aim of improving it. Following reviewer's recommendations in her first revision of the manuscript, new tables have been modified and included (table 2 and table 3) and new text has been included in the results section in order to improve understanding of the analysis and interpretation of results.
We copy the new text added in the previous version, pages 8-9 lines 252-267; pages 9-10 lines 282-315. It is as follows:

Lack of continuing education (pages 8-9 lines 252-267)
Lack of continuing education was considered a relevant factor by 80% of the FGs (4/5) in any case where a pharmacist dispensed antibiotics without a prescription. As shown above, lack of continuing education can be viewed from different standpoints, e.g., "In specific diseases, there is a range of antibiotics and you start with the oldest." (FG3; W3). In this case, it shows the lack of knowledge about what to start with the first-line antibiotic, that is not always the oldest.
Age is also referred to as a key variable to explain the existence of lack of continuing education, being older pharmacists which exhibit this deficit. "Older pharmacists give out antibiotics much more readily."(FG2, M1), and, "Young people give out fewer antibiotics." (FG3; W3).
Another aspect mentioned and related to lack of continuing education is the consideration of the problem of resistance as a recent phenomenon. "I think that issue of resistance has recently begun, not so long ago…" (FG1, W2).

Indifference (pages 9-10 lines 282-315)
Participants indicate the existence of indifference and mutual consent between community pharmacists and other health-care professionals, chiefly physicians, along with inappropriate attitudes to prescribing and dispensing antibiotics; Noting the lack of communication as indirectly associated with indifference, i.e., "I give you amoxicillin-clavulanate… but you go to your doctor and bring me the prescription. That way I feel I'm blameless." (FG5; W2).

In a third FG, the following statements were made: "The two professions are hardly involved with each other, there are no close ties, so that we criticise our mistakes but don't value our successes"; and, "Sometimes I dispense an inappropriate antibiotic because I don't have the time to contact the patient's physician." (FG2; W1) (Table 1). In this case they identify communication difficulties as the cause of inadequate dispensation but show indifference when solving the problem.
We also appreciate the existence of Indifference when they must transmit adequate information about the problems of resistances to customers who go to the pharmacy to buy antibiotics, well, Indifference is other possible way to contribute to develop microbial resistances. “Ok, I see, but this is about that it is difficult for them (people) to understand, I mean, surely if you talk to somebody about resistance it will sound familiar to him, but trying to explain him how resistances are generated..., you know what I mean, an effective way to make them understand that if they take that, or those, antibiotic without needing it, it's not going to take effect later on” (FG1, W2).
Finally, another aspect that is framed within the Indifference is the fact that in Spain the pharmacist is also a businessman. "In addition to being health-care professionals, we are also businessmen." (FG2; M2), so it is concerned, in addition to the health of the individual, by the profitability of the business. This statement reflects it: "Take it home. If you get better, don't take it, just bring it back to me! …and most people bring it back." (FG2; W1). This sentence also refers to what we call "delayed dispensing" which is related to the delayed prescriptions. Delayed prescriptions are those that are written but are only used if the symptoms do not improve. Delayed dispensing of antibiotics can thus be defined as the dispensing of antibiotics for a patient, on the condition that they are not to be used immediately but only in the event that the symptoms fail to improve.

In addition, in order to increase external validity and reproducibility, the present work has followed the results format of previous publications of our research group and other groups with qualitative methodology in biomedicine studies[1,2,3,4,5].
1.- Vazquez-Lago JM, Lopez-Vazquez P, López-Durán A, Taracido-Trunk M, Figueiras A. Attitudes of primary care physicians to the prescribing of antibiotics and antimicrobial resistance: a qualitative study from Spain. Fam Pract. 2012; 29: 352-60.
2.- Roque F, Soares S, Breitenfeld L, López-Durán A, Figueiras A, Herdeiro MT. Attitudes of community pharmacists to antibiotic dispensing and microbial resistance: a qualitative study in Portugal. Int J Clin Pharm. 2013;35(3):417-24.
3.- Hansen MP, Howlett J, Del Mar C, Hoffmann TC. Parents' beliefs and knowledge about the management of acute otitis media: a qualitative study. BMC Fam Pract. 2015;16:82.
4.- Sanchez GV, Roberts RM, Albert AP, Johnson DD, Hicks LA. Effects of knowledge, attitudes, and practices of primary care providers on antibiotic selection, United States. Emerg Infect Dis. 2014;20(12):2041-7.
5.- Kaae S, Malaj A, Hoxha I. Antibiotic knowledge, attitudes and behaviours of Albanian health care professionals and patients – a qualitative interview study. J Pharm Policy Pract. 2017;10:13.

I also believe that the quality of English in some of the newly added sections would benefit from review.
English has been revised in this new version by a native English speaker. We hope that now all inaccuracies have been improved from the point of view of language and grammar.

Title
"a qualitive study of Spanish pharmacists" may be more appropriate than a study "on" them.
Thank you for the advice. We have corrected it. In all documents the tittle is “Knowledge, attitudes, perceptions and habits towards antibiotics dispensed without medical prescription: a qualitative study of Spanish pharmacists.”

Methods
Page 5, line 130, I am unfamiliar with the term 'a dash of a FG [focus group]' - do the authors mean

'script' or 'topic guide'?
We refer to a script, which was to be followed during the group sessions to facilitate the identification of attitudes and/or factors. It is corrected in the text and replaced “a dash of a FG” by “a script of a FG”.
We have replaced it in the text, page 5, line 127.

Page 7, 196, can the authors clarify whether the analysis "two independent researchers" or "two researchers working independently", as their explanation seems to suggest the latter?
Thank you for the advice. We have clarified it. The analysis of the recordings of the focus groups has been carried out in two steps:
First, the recordings were transcribed by an independent researcher (MTT). And then in a second step, the transcripts were interpreted by two researchers working independently (CGG and JVL).
It is corrected in the method section of the abstract, page 2, lines 44-45; and in the section of methodology of the text, page 6, line 194.

Table 1
'Bad' is insufficently descriptive to describe continuing education. Do authors intend to imply that the amount of continuing education is insufficient or that the quality was poor or both?
With the term "bad" authors pretend to imply that continuing education was poor, both from the point of view of quantity and quality. We proceed to correct Table 1. (page 5 line 140)

COREQ checklist
I can not find evidence in the manuscript of reflexivity on the part of the researcher.
We consider that “Reflexivity” understood as an attitude of systematically attending to the context of the construction of knowledge, especially to the effect of the researcher, at every step of the research process, can be approximated with the points answered in domain 1 of COREQ checklist.
We clarify in this sense all the points in domain 1 of COREQ checklist, where we write the sentences of the text to which we refer.

Review English:
English has been revised in this new version by a native English speaker. We hope that now all inaccuracies have been improved from the point of view of language and grammar.
- page 2, line 47:
“Proceedings were transcribed by an independent researcher and interpreted by two researchers working independently. We used the Grounded Theory approach.”
- page 3, 81:
“The generalization of the results could also be compromised due to the intrinsic characteristics of the pharmaceutical system in Spain. In the system of pharmaceutical provision in Spain, antibiotics necessarily require a prior prescription by the physician, and all drugs must always be dispensed by pharmacies and cannot be purchased in other types of establishments.”
- page 6, line 161;
“In order to work in a community pharmacy in Spain, it is compulsory to be a member of the Official Colleges of Pharmacists (OCP). Using the “snowball method”, the OCP sent project information in the usual way to all community pharmacists. Community pharmacists who were interested in FG participation had to send a reply to the research team. FG sessions were designed to be held with a pre-established number of participants, between 5 and 10 pharmacists in attendance in Galicia.”
- page 7, line 206;
“No computer software was used to analyze the process because the number of FGs was performed was not large.”
- page 10, 302;
“We also observed the existence of Indifference about transmitting adequate information about the

problems of resistances to customers who go to the pharmacy to buy antibiotics, as Indifference is another possible way to contribute to developing microbial resistances. “Ok, I see, but this is about their (people’s) difficulty to understand, I mean, surely, if you talk to somebody about resistance, it will sound familiar to them, but trying to explain to them how resistances are generated..., you know what I mean, an effective way to make them understand that, if they take this or that antibiotic without needing it, it's not going to have any effect later on” (FG1, W2).
- page 15, line 474
“All published and unpublished study data are a set of all you need, should you want to confirm or reproduce our research in a different field than ours.”

Check references: page 13, page 402; page 13, line 408
References were revised and corrected.

Reviewer: 2
Reviewer Name: Fátima Roque
Institution and Country: Polytechnic Institute of Guarda, Portugal Please state any competing interests or state ‘None declared’: None declared

Please leave your comments for the authors below As mentioned before, this si an interesting and well written article. The changes made by the authors during the review process have improved the manuscript.
Thank you so much. We really appreciate your commentary. And thank you for accepting and reviewing our manuscript.

VERSION 3 – REVIEW

REVIEWER	Anwen Cope Cardiff and Vale University Health Board/Cardiff University, UK
REVIEW RETURNED	07-Jun-2017

GENERAL COMMENTS	In this resubmission the authors have addressed the majority of points raised during previous reviews.